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SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE •

OCTOBER 10, 1931

To the Heart of a Flower by X-Ray

See Page 232

A SCIENCE SERVICE PUBLICATION

SCIENCE NEWS LETTER

VOL. XX *No. 548*

The Weekly Summary of Current Science

Published by

SCIENCE SERVICE

The Institution for the Popularization of Science organized under the auspices of the National Academy of Science, the National Research Council and the American Association for the Advancement of Science.

Edited by WATSON DAVIS

Subscription rates—$5.00 a year postpaid; two years, $7.00; 15 cents a copy. Ten or more copies to same address, 5 cents a copy.

In requesting change of address, please give old as well as new address.

Advertising rates furnished on application.

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Publication Office, 1930 Clifton Ave., Baltimore, Md. Editorial and Executive Office, Constitution Ave. at 21st St., N. W., Washington, D. C.

Address all communications to Washington, D. C. Cable address: Scienserve, Washington.

Entered as second class matter October 1, 1926, at the post-office at Baltimore, Md., under the act of March 3, 1879. Established in mimeographed form March 13, 1922. Title registered as trade-mark, U. S. Patent Office.

DO YOU KNOW THAT

A herd of Afrikander cattle is to be imported into Gulf states from South Africa.

No part of the United States is entirely exempt from frost except certain of the Florida Keys.

Chemists have produced a new compound for use in covering wooden shoe heels, which is said to be scuff-proof.

The London Zoo once had an albino cobra, almost entirely white and with pink eyes.

A well-known naturalist found one prairie dog town that covered several thousand square miles and had a population of about 400,000,000 prairie dogs.

The center of population of the United States has moved 22 miles west and about 7½ miles south in the past ten years, and is now located in Greene County, Indiana, near Linton.

The word magnet comes from the fact that the best specimens of lodestone are obtained from Magnesia, a city in Asia Minor.

That a great drought commenced in 1276 and extended for a 23-year period is shown by the studies made of the annual rings of old trees by Dr. A. E. Douglass.

A survey of the number of prescriptions filled by Maryland pharmacists shows that in this one state 3,347,000 prescriptions were filled in one year.

Experiments in which the entire cotton plant is used in making rayon are being conducted by the University of North Carolina.

The Greek physician Galen, who lived in the second century A. D., advocated for his feminine patients a cosmetic cream made of white wax and rose oil, and this preparation remained in pharmaceutical use for centuries.

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Science Service presents over the radio, an address

THE EVER-CHANGING LANDSCAPE

By Dr. H. C. Cowles, professor of plant ecology at the University of Chicago.

Friday, October 16, at 3:45 P. M., Eastern Standard Time

Over Stations of

The Columbia Broadcasting System

ARCHAEOLOGY

Ruins of Greek Building Found Under Modern Homes

Sculptures and Inscriptions also Discovered During Summer's Excavations in Market Place of Ancient Athens

AMERICAN archaeologists excavating at the Agora, the market place of ancient Athens, have concluded a highly successful summer's work, and have begun to take stock of their discoveries. After demolishing two complete blocks of small modern Greek homes and shops, the archaeologists and workmen probed ten feet below the ground, locating in the process the ruins of old buildings and also sculptures and inscriptions, as well as many small objects.

In the northern part of the market place have been uncovered foundations of a large building, says Prof. T. Leslie Shear of Princeton University in a special statement to Art and Archaeology. Prof. Shear is field director for the American School of Classical Studies at Athens.

Identifying the buildings in the Athenian Agora is a matter of keen interest to classical scholars. Prof. Shear has identified the large, new-found building as one of the stoas, or covered colonnades of the market place. The building was long and narrow and had two rows of columns, of which only foundations remain.

Office of Chief Magistrate

In the shelter of the stoas the Athenians conducted business, held trials and meetings, and engaged in philosophical discussions. The newly excavated stoa has been specifically identified as the Stoa Basileios, which was the office of one of the chief magistrates of Athens, known as the Archon Basileios. This stoa, according to the Greek writer Pausanias, stood on the right of the entrance to the Agora.

In the southern area of excavation, the digging showed another building which appears to have been one of the important edifices of the market place. The building was narrow, with steps and column bases of Hymettus marble. Part of the ruins still lie hidden beneath modern structures, but Prof. Shear tentatively identifies the building as the Stoa of Zeus Eleutherios.

While exploring a large water-channel, apparently in the wide street which ran through the Agora, the excavators discovered a colossal statue of the Emperor Hadrian. The statue had been thrown head first into the channel.

Regarding this statue, which has not yet been dislodged from its position, Prof. Shear writes:

"Pausanias states that a statue of Hadrian stood by the Zeus Stoa. As the statue which has been found is too large and heavy to have been transported far in later times, it is probably lying close to the place where it was originally erected. This provides further evidence that the building on the west of the area is the Stoa of Zeus."

A broken statue of a woman found near the steps of the Zeus Stoa is pronounced a fine piece.

"The beauty of the work and the technique of the execution suggest a Greek original of the fourth century B. C.," Prof. Shear reports.

Special Method of Cataloguing

A special method of cataloguing the objects removed from the sites has been devised by Prof. and Mrs. Shear, and is said to be so accurate and complete that in future any investigator, referring to this collection of objects and the card catalogue, will be able to find all the known facts about any object. Such a system as this has rarely been attempted in archaeological history.

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Courtesy of T. Leslie Shear

STOA BASILEIOS

A government building of ancient Athens is here having its foundations uncovered. The temple at the right is the Theseum.

GEOGRAPHY

America Really Alberica, Old Czech Paper Shows

WHEN the geographer Martin Waldseemüller in 1507 gave America its present name, in honor of Vespucci, the Italian navigator who he thought had discovered the New World, he committed a double error. For Vespucci's first name was not Americus or Amerigo, but Albericus or Alberico. To be consistent, this continent should be called Alberica.

This curious fact has been disclosed by a newly published Czech study of an ancient communication from Vespucci, recently issued in Prague, a copy of which has been received by Dr. Ales Hrdlicka of the U. S. National Museum. It is a reprint of an account of one of Vespucci's voyages, which had been translated out of its original Italian into Latin, and thence into Czech, appearing in Prague in 1504. After reposing on the shelves of monastery libraries for over four centuries, it at last came to light in the library of the National Museum at Prague. The present republication gives a facsimile reproduction of the brief paper in its original black-letter Czech text, a transliteration in modern Czech, and translations in English and Spanish, together with a critical commentary by C. Straka, librarian of the Strahov Monastery.

In this pamphlet, the principal part of which is a report in letter form from Vespucci to the Italian merchant prince, Lorenzo Piero Francesco di Medici, the navigator signed his first name as Alberico. The original Italian draft is lost, but the Latin translation gives the name as Albericus, and in the black-letter Czech text it is as Alberykus. Other writings of Vespucci before 1507 also give his first name as Albericus; he appears not to have been known as Amerigo or Americus before the publication of Waldseemüller's suggestion to name the New World after him. It is even possible that Vespucci may have got his name from the New World, instead of the other way about; for it is stated by some authorities now that one of the tribes discovered by early voyagers called themselves by a name that sounded something like "Amerigé."

TOWARD "ALBERICA"

Title-page of 427-year-old report of the adventures of Albericus (not Americus) Vespuccius and his associates in the New World. Published in Prague, 1504.

Science News Letter, October 10, 1931

PSYCHOLOGY

Child in Small Family Held Most Intelligent

CHILDREN in large families have less intelligence than those in small families, Dr. Shepherd Dawson, British psychologist, has announced. Individual mental tests given to large numbers of children of approximately the same social status revealed a small but significant negative correlation between a child's intelligence and the number of his brothers and sisters, he said. This is encouraging to only children, but may have serious consequences for future generations. Dr. Dawson urged further study on the inheritance of mental aptitudes.

Science News Letter, October 10, 1931

PHYSICS

Scientist Says Universe Is Actually Exploding

THE UNIVERSE is actually exploding and the galaxies are scattering apart at a terrific rate, Sir Arthur Eddington, professor of astronomy at Cambridge University, contended before the British Association for the Advancement of Science hundredth anniversary meeting. In support of his contention he presented computations based solely on pure mathematical and physical theory, without the use of astronomical data. The rate of nebular recession thus obtained is in close accord with Dr. Edwin P. Hubble's Mt. Wilson Observatory figures for the red shift of nebular spectra.

Prof. Hubble said, "Detailed theories of stellar evolution are overshadowed by the fact that the time scale is again in the melting pot. With a rapid-expansion universe, a very long time scale of billions of years, fashionable recently, becomes exceedingly incongruous. We have to accept an age of ten to the tenth power or ten billion years for galaxies and presumably also for stars."

Since the age of the earth alone, derived through the radioactive method, is over a billion years this embarrasses astronomers, geologists and biologists. Prof. Eddington derived the actual rate of expansion of the universe from the wave equation for the electron, which is the fundamental equation of the modern quantum theory. This equation, adapted to the curvature of space, contains the term: "the square root of the number of electrons in the universe divided by the radius of the universe in a state of equilibrium," which term is the mass of the electron, usually written: $\frac{M C^2}{E^2}$.

Combined with the formulae of the relativity theory, this gives the principal data of the size of the universe. Its original radius was 1,070,000,000 light-years, before it started expanding. Its rate of expansion is 528 kilometers per second per megaparsec, compared with 465 derived from the Hubble astronomical data. It is over a hundred miles per second for each million light-years' distance. "The close accordance of the theory with observation forces acceptance of an alarmingly rapid dispersal of nebulae, with important consequences in limiting the time available for evolution," Prof. Eddington concluded.

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GEOPHYSICS

Electric Apparatus Probes Secrets of Earth's Interior

Invention Promises to Aid in Location of Valuable Ores And to Assist Mine Operator and Construction Engineer

DELVING into the secrets of the earth 2,000 feet down has been accomplished by means of electricity. An apparatus, invented by Oliver H. Gish of the Department of Terrestrial Magnetism of the Carnegie Institution of Washington, works from the surface, but has made great masses of deeply hidden material reveal something of their nature. The possibility of locating valuable ores by this means is strongly indicated, while information necessary to the mine operator and construction engineer may be thus secured.

With the new apparatus, which has been recently patented, a current is passed through a portion of the earth's crust. The difference in electrical pressure between two selected points affected by this current is then measured. From it can be calculated the resistance of the earth at that point. As the resistance of geological formations varies widely, an index to their characters is obtained.

The inventor, Mr. Gish, and his associate, W. J. Rooney, have conducted field experiments with this apparatus. The original tests were made at four sites around Washington. Extensive earth-resistivity surveys have been made with this apparatus by Mr. Rooney on the sites of the Watheroo Observatory in western Australia, the Huancayo Observatory in Peru, and the Tucson Observatory in Arizona, and by Messrs. Gish and Rooney at the site of the Ebro Observatory in Spain.

Used by Institutions

Outstanding scientific institutions using apparatus constructed after the department's design include the U. S. Bureau of Mines, U. S. Geological Survey, the Michigan College of Mining and Technology, the Massachusetts Institute of Technology, and the Imperial Geophysical Experimental Survey of Australia. The experimental work so far done with this apparatus indicates that in addition to its use as a tool for the location of mineral deposits and for some aspects of engineering, it will make possible more general investigations in geophysics involving the structure of the earth's crust.

Since the technical publication by the Institution of the first information describing this apparatus, the essential features have also come to be used rather extensively by a number of commercial prospecting organizations.

Science News Letter, October 10, 1931

MEDICINE

Forerunners of Cancer In Digestive Tract Named

EIGHT CONDITIONS of injury or degeneration which occur in the digestive tract before the development of cancer were listed by Prof. Matthew J. Stewart of the University of Leeds in a series of lectures delivered before the Royal College of Physicians in London and just reported in the *Lancet*, British medical publication.

"At the present time it is probably true to say that the most hopeful side of cancer research is that concerned with the demonstration of local causative factors, and the recognition and prevention of precancerous lesions of one kind or another," Prof. Stewart declared at the beginning of his first lecture.

"Unfortunately, it is to the more superficial forms of malignant disease, a very small fraction of the whole, that this principally applies."

Conditions of the digestive tract that may develop into cancer are not so definitely known as precancerous conditions elsewhere in the body, Prof. Stewart pointed out, nor are the opportunities so good for preventing cancer of the digestive tract.

In one year there were 56,896 deaths from cancer in England and Wales, according to the official figures he quoted. Of these, over half in men and nearly half in women were referable to the digestive tract.

Prof. Stewart divided the chief precancerous conditions into three groups. The first consisted of chronic inflammatory conditions, such as sores due to burns and chemical caustics; cirrhosis of the liver; certain diseased conditions of the gallbladder; chronic stomach ulcer; chronic inflammation of the stomach; chronic duodenal ulcer; and three conditions less well known to the layman, diverticulitis, hemochromatosis and leucoplakia. The second group consisted of simple tumors which may be forerunners of cancer. The third group consisted of sores or injuries due to animal parasites.

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MINE SAFETY

Little Coal Dust Needed To Spread Mine Explosion

TESTS have now determined just how little coal dust the air needs to spread the flame produced in a mine explosion. At the experiment station of the U. S. Bureau of Mines at Pittsburgh, investigations by G. S. Rice and H. P. Greenwald showed that the lower limit of inflammability lies between .032 and .08 ounces of dust per cubic foot of air.

A special gallery was used to conduct the tests. Pittsburgh coal dust passed through a 200-mesh sieve was equally divided between the floor of the gallery and the shelves overhead and on the sides. The source of ignition was a gas explosion which raised the dust in clouds. Measurements were taken as to how far the flame traveled with different concentrations of dust.

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NATURAL MAGNET

Huge 400-pound lodestone on exhibition at Field Museum of Natural History. Its powerful magnetic influence is illustrated by the nails and other objects. It comes from the Wasatch Mountains in Utah.

INVENTION

The Franklin Stove

"A Classic Invention"

This First Down-Draft Stove is Still a Good Design for "The Gentleman Who is Able to Manage his Own Fire"

Description of a new STOVE for burning of Pitcoal, and consuming all its smoke. By Dr. B. Franklin. In PHILOSOPHICAL AND MISCELLANEOUS PAPERS, lately written by B. Franklin. London: Printed for C. Dilly, in the Poultry, M. DCC. LXXXVII (1787).

TOWARDS the end of the last century an ingenious French philosopher, whose name I am sorry I cannot recollect, exhibited an experiment to show that very offensive things might be burnt in the middle of a chamber, such as woolen rags, feathers, &c., without creating the least smoke or smell. The machine in which the experiment was made, if I remember right, was of this form, made of plate iron. *(Figure 1)*. Some clear-burning charcoals were put into the opening of the short tube A, and supported there by the grate B. The air, as soon as the tubes grew warm, would ascend in the longer leg C, and go out at D, consequently air must enter at A descending to B. In this course it must be heated by the burning coals through which it passed, and rise more forcibly in the longer tube, in proportion to its degree of heat or rarefaction, and length of that tube. For such a machine is a kind of inverted syphon: and as the greater weight of water in the longer leg of a common syphon, in descending, is accompanied by an ascent of the same fluid in the shorter; so, in this inverted syphon, the greater quantity of levity of air in the longer leg, in rising, is accompanied by the descent of air in the shorter. The things to be burned being laid on the hot coals at A, the smoke must descend through those coals, and be converted into flame, which, after destroying the offensive smell comes out at the end of the longer tube as mere heated air.

Whoever would repeat this experiment with success, must take care that the part A, B, of the short tube be quite full of burning coals, so that no part of the smoke may descend and pass by them without going through them, and being converted into flame; and that the longer tube be so heated as that the current of ascending hot air is established in it before the things to be burnt are laid on the coals; otherwise there will be a disappointment.

It does not appear, either in the Memoirs of the Academy of Sciences, or Philosophical Transactions of the English Royal Society, that any improvement was ever made of this ingenious experiment, by applying it to useful purposes. But there is a German book, entitled *Vulcanus Famulans,* by Joh. George Leutmann, P.D. printed at Wirtemberg in 1723, which describes, among a great variety of other stoves for warming rooms, one which seems to have been formed on the same principle, and probably from the hint thereby given, though the French experiment is not mentioned. . . .

Leutmann Not Inventor

It appears to me by Mr. Leutmann's explanation of the operation of this machine, that he did not understand the principles of it, whence I conclude he was not the inventor of it; and by the description of it, wherein the opening at A is made so large, *(Figure 20)* and the pipe E, D, so short, I am persuaded he never made nor saw the experiment; for the first ought to be much smaller, and the last much higher, or it will hardly succeed. The carrying it in the kitchen, too, every time the fire should happen to be out, must be so troublesome, that it is not likely ever to have been in practice, and probably has never been shown but as a philosophical experiment. The funnel for conveying the vapor out of the room would besides have been uncertain in its operation, as a wind blowing against its mouth would drive the vapor back.

The stove I am about to describe, was also formed on the idea given by the French experiment, and completely carried into execution before I had any knowledge of the German invention; which I wonder should remain so many years in a country where men are so ingenious in the management of fire, without receiving long since the improvements I have given it.

A, the bottom plate *(Figure 2)*, which lies flat upon the hearth, with its partitions 1, 2, 3, 4, 5, 6, that are cast with it, and a groove Z Z, in which are to slide the bottom edges of the small plates Y, Y, figure 12; which plates meeting at X close the front.

B 1, figure 3, is the cover plate showing its under side, with the grooves 1, 2, 3, 4, 5, 6, to receive the top edges of the partitions that are fixed to the bottom plate. It shows also the grate W W, the bars of which are cast in the plate, and a groove V V, which comes right over the groove Z Z, figure 2, receiving the upper edges of the small sliding plates Y Y, figure 12.

B 2, figure 4, shows the upper side of the same plate, with a square impression or groove for receiving the bottom mouldings T T T T of the three-sided box C, figure 5, which is cast in one piece.

D, figure 6, its cover, showing its under side with grooves to receive the upper edges S S S of the sides of C, figure 5; also a groove R, R, which when the cover is put on come right over another Q Q in C, figure 5, between which it is to slide.

E, figure 7, the front plate of the box.

P, a hole three inches diameter through the cover D, figure 6, over which hole stands the vase F, figure 8,

Motionless As The Fixed Stars

was a proverb among the ancients, but

JAMES BRADLEY

discovered a motion of their images which has led to computation of their real movements.

IN THE NEXT CLASSIC OF SCIENCE

THE FRANKLIN STOVE

And its several parts, with the implements necessary for its use. From Franklin's original account of his invention.

which has a corresponding hole two inches diameter through its bottom.

The top of the vase opens at O, O, O, figure 8, and turns back upon a hinge behind when coals are to be put in; the vase has a grate within at N N of cast iron H, figure 9, and a hole in the top one inch and a half diameter to admit air, and to receive the ornamental brass gilt flame M, figure 10, which stands in that hole, and, being itself hollow and open, suffers air to pass through it to the fire.

G, figure 11, is a drawer of plate iron, that slips in between in the partitions 2 and 3, figure 2, to receive the falling ashes. It is concealed when the small sliding plates Y Y, figure 12, are shut together.

I, I, I, I, figure 8, is a niche built of brick in the chimney and plastered. It closes the chimney over the vase, but leaves two funnels, one in each corner, communicating with the bottom box K K, figure 2. . . .

Let the first fire be made after eight in the evening, or before eight in the morning, for at those times and between those hours all night, there is usually a draft up a chimney, though it has long been without fire; but between those hours in the day there is often in a cold chimney a draft downwards, when, if you attempt to kindle a fire, the smoke will come into the room.

But to be certain of your proper time, hold a flame over the air-hole at the top. If the flame is drawn strongly down for a continuance, without whiffling, you may begin to kindle a fire.

First put in a few charcoals on the grate H.

Lay some small sticks on the charcoals.

Lay some pieces of paper on the sticks.

Kindle the paper with a candle.

Then shut down the top, and the air will pass down through the air-hole: blow the flame of the paper down through the sticks, kindle them, and their flame passing lower, kindles the charcoal.

When the charcoal is well kindled, lay on it the sea-coals, observing not to choak the fire by putting on too much at first.

Flame Descends

The flame descending through the hole in the bottom of the vase, and that in plate D into the box C, passes down farther through the grate W W in plate B 1, then passes horizontally towards the back of the chimney; there dividing, and turning to the right and left, one part of it passes round the far end of the partition 2, then coming forward, it turns round the near end of partition 1, then moving backward, it arrives at the opening into the bottom of one of the upright corner funnels behind the niche, through which it ascends into the chimney, thus heating that half of the box and that side of the niche. The other part of the divided flame passes round the far end of partition 3, round the near end of partition 4, and so into and up the other corner funnel, thus heating the other half of the box, and the other side of the niche. The vase itself, and the box C, will also be very hot, and the air surrounding them being heated, and rising, as it cannot get into the chimney, it spreads in the room; colder air succeeding is warmed in its turn, rises and spreads, till by the continual circulation the whole is warmed.

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ENTOMOLOGY-GENETICS

Insect Species Produce Families all of Same Sex

INSECTS that produce families of only one sex, instead of the ordinary half-male, half-female ratio, have been studied by Dr. C. W. Metz at the Johns Hopkins University. They belong to the genus Sciara, which is a tiny insect related to flies and mosquitoes.

In his endeavor to find the reason for this strange state of affairs, Dr. Metz has made microscopic examination of the chromosomes in the germ-cells of his insects. He finds that the male reproductive cells apparently are able to transmit either maleness or femaleness to the offspring. The sex determination, excluding either males or females completely from the progeny of a given mother, must therefore take place in the body of the mother insect. But just what the mechanism of this determination may be, it has not yet been possible to discover. Dr. Metz, who is also associated with the department of genetics of the Carnegie Institution of Washington, will have his results published in the forthcoming issue of *The Quarterly Review of Biology*.

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ASTROPHYSICS

Millikan Offers New Data on Cosmic Rays

IN THE DEPTHS of space, where atoms are sparse, a cluster of four hydrogen atoms, free from collisions for a long time, will jump over their potential wall and form a nucleus emitting a cosmic ray, Prof. Robert Andrews Millikan, of the California Institute of Technology, declares. Dr. Millikan's theory is based on the demonstration that atomic changes not found on the earth occur in the nebulae, where atomic collisions are infrequent. Dr. Millikan's new researches during the past summer support the view that cosmic radiation consists of the wirelessed birth-cries of helium, oxygen, silicon and iron, synthesized from hydrogen in interstellar space. His report was presented at the recent meeting of the British Association for the Advancement of Science.

Both Dr. Millikan and Sir Oliver Lodge attacked the second law of thermodynamics. "It is merely a generalization based on observation on earth, that all energy tends to be converted into heat and radiated away, hence lost," said Dr. Millikan. "A final inevitable increase of entropy to a maximum is a bugbear idol to which philosophers need not bow the knee," said Sir Oliver.

He also contended that the application of the unvivified laws of physics to the universe assumes there is nothing or no one to wind it up or guide it to some nobler end.

Referring to the new quantum theory, he said: "Guiding waves determine the path of a particle of matter. Whether there is any connection of life and mind is still an unanswered question."

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PSYCHOLOGY

Degrees of Badness in Bad Boys are Determined

HOW BAD is a bad boy? This question, which has been worrying parents for years, had become an even greater problem for the social or child clinic worker who must deal in an impartial manner with the misbehavior of great numbers of boys and girls. Dr. Luton Ackerson of the Institute for Juvenile Research in Chicago has determined statistically the degree of badness of various types of bad behavior as judged by three different standards.

One of these standards is the relation of the particular trait to an otherwise unhealthy personality. From this point of view the most serious traits are a definite diagnosis of mental disease, "queerness," depression, talking to self; one of the least serious is disobedience.

From the point of view of association with a large total of bad conduct, the worst offenses include swearing and bad language, making trouble in the home, destructiveness, "annoying" girls, running away, disobedience, stealing and fighting.

The third way of judging was according to the chances of arrest. Here running away, stealing, bad companions, truancy, staying out late at night and loitering lead the list, and fighting, swearing, fire-setting, and sex delinquency come at the end.

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ARCHAEOLOGY

Philistine Stronghold Among Oldest Settlements

GAZA, the Philistine stronghold whose gates Samson carried away and where he later brought death to his enemies and himself alike beneath the ruins of their temple, is apparently one of the oldest of human settlements. This was disclosed when a report of excavations by Sir W. M. Flinders Petrie, noted British archaeologist, showed a history of human occupation on the site of the old city running back to New Stone Age times.

There were two sites of Gaza. The "New Town," dating back beyond Samson, is still there. The "Old Town," whose ruins Flinders Petrie has just been exploring, is about five miles away. It had grown old and was abandoned by its inhabitants about 2000 B. C.—a thousand years before the siege of Troy.

The latest period of occupation of the old city was that of the Hyksos, the wild horsemen from the north, who also conquered Egypt. Burials of their warriors usually have horse skeletons and trappings along with the human remains. The steed went with his master into the next world.

Beneath the Hyksos stratum the explorers found evidences of the older Canaanite culture, a higher civilization than that of the invaders who overran it. These Canaanites had city planning, public baths, and well-built religious shrines. They had skillfully made gold jewelry, and their weights indicate trade with Egypt, North Syria and Babylonia.

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IN SCIENCE

BOTANY

X-Rays Find New Beauties For Students of Flowers

See Front Cover

SEARCHING the secrets of a flower's heart acquires new esthetic significance at least, and may become of importance in plant physiology and anatomy, too, through an X-ray technique developed by Mrs. Hazel Engelbrecht, of Des Moines. It is not the first time that X-rays have been used on flowers; but Mrs. Engelbrecht has brought to bear a rare combination of most sensitive control of her unusual medium and an appreciation of pictorial composition that makes the result, though novel, art in its truest sense.

Science News Letter, October 10, 1931

PHYSICS

Rejuvenation of Glass Accomplished by Heat

REJUVENATION of tired glass has been accomplished in experiments by A. Q. Tool and R. Stair of the U. S. Bureau of Standards.

Special glass used to pass ultraviolet light and permit the sun to give its full share of health rays to man, may get tired and refuse, as ordinary glass does, to let the health rays through. But the experimenters found that by heating this glass at about 500 degrees Centigrade for a few hours, it may be brought back to ultraviolet transparency.

Chemical changes involving oxidation of the iron content of the glass are usually held responsible for its gradually becoming opaque to ultraviolet light. Mr. Tool and Mr. Stair considered the phenomenon called "thermoluminescence." It seemed as though the glass absorbed light when in use, becoming discolored and tired. Then during the heat treatment it gave off its pent-up light in a glow which lasted until its discoloration had disappeared and it was ready to serve again.

The temperature treatment if too low will not completely restore tired glass to its former transparency to the ultraviolet light, the experimenters explained.

Science News Letter, October 10, 1931

NCE FIELDS

ARCHAEOLOGY

Ancient Counterpart Of Church Discovered

TWO MILLENIA before the earliest known church, there existed in Crete a place of worship surprisingly like a modern chapel, Sir Arthur Evans, British archaeologist, says in reporting the discovery of a temple-tomb of a house of Minos south of Knossos. This ancient counterpart of a church was the residence of the priestly warden of a Minoan Holy Sepulchre. The private chapel had choir stalls and chancel screens, and in its inner sanctum an altar and sacred cult-symbols. One funeral vault temple unearthed nearby contained miniature jugs indicating that snake worship was part of the rites.

Sir Arthur unearthed a sepulchral monument beneath a limestone bluff south of Knossos, following a clue given by discovery of a massive gold signet ring which grave robbers had dropped nearby during their plundering, after the temple had been partially ruined by an earthquake in 1520 B. C. A mortuary chamber excavated in the rock was combined with the sanctuary building; it was surmounted by a columnar shrine above ground. The discovery confirms a very ancient Cretan tradition, preserved by Diodorus, that after the treacherous death of the last king, named Minos, a magnificent dual monument tomb was built for him under the earth, with a temple above it dedicated to a goddess. The temple-tomb has a pavilion for funeral feasts and a paved court for funeral sports.

Science News Letter, October 10, 1931

ARCHAEOLOGY

American Museums May Profit by New Greek Law

MUSEUMS and art galleries in this country may yet be enriched by real Greek sculptures and vases to replace many plaster casts of such things that they now display. A new Greek law makes this possible—if the law can be carried out.

Difficulties involved in putting the new law into effect are explained by Arthur S. Riggs, editor of *Art and Archaeology*, who has just returned from Athens. The new law, passed by the Greek Government, permits the National Museum of Archaeology to sell duplicates of antiquities, Mr. Riggs said. Tons of such material are stored in the basement of the museum. Vases, figurines, some metal work and many beautiful fragments unearthed in excavations are lying there, and much of the material duplicates objects on exhibit.

Institutions in America and other countries have always been eager to obtain just such objects as these.

Science News Letter, October 10, 1931

PUBLIC HEALTH

Foreign Experts Studying U. S. Ship Fumigation

LATEST methods of fumigating loaded ships, as used at the New York quarantine station of the U. S. Public Health Service, have just been observed by a group of experts appointed by a special commission of the Health Section of the League of Nations.

These experts reported they were highly pleased with the methods, which were demonstrated by Surgeon Charles L. Williams, U. S. Public Health Service. They will present a report of their investigations to the League of Nations next month.

Surgeon-General Hugh S. Cumming, U. S. Public Health Service, is chairman of the committee of experts. Other members are: Dr. R. C. Stock and Dr. C. W. Monier-Williams of the British Ministry of Health, London; Dr. Adolfo Vila of Cadiz, Spain; Dr. M. F. DeBruyne of Rotterdam, Holland; Dr. Charles Vigne of Havre, France; Dr. William Dryer of Bremerhaven, Germany; and Dr. Charles L. Williams, U. S. Public Health Service.

Fumigation of ships is carried on to destroy rats and vermin that might carry disease, and thus to protect seaports and nations generally from importation of disease. The U. S. Public Health Service seems to have met satisfactorily the difficult problem of fumigating loaded ships.

The method, as described by Dr. Williams, consists in spraying liquid hydrocyanic acid under a pressure of 75 to 100 pounds.

Other methods of fumigation will still be satisfactory on the ordinary ship which does not present special problems.

Science News Letter, October 10, 1931

ENGINEERING

California Building Heated by Refrigeration

REFRIGERATION in sunny California now provides for winter heat. The same system that cools air in summer has been made to warm things up when the snow starts thickening on the mountain peaks.

In a new office building, erected for an electrical company in Los Angeles, suitable apparatus has been installed. As in an ordinary refrigeration system, the refrigerant is vaporized by absorbing heat from a container of water, which it cools. When it condenses it heats up the water of a second container.

Air is passed over the cooled water to make the building comfortable in summer. During the winter months, the water from the condenser is circulated through a tubular device which raises the building's air supply to a temperature of 80 degrees Fahrenheit. To provide for an outside source of energy, necessary in the operation of the system, the atmosphere is used. Towers on the roof of the building force an air draft which gives the water in the two containers temperatures from which the refrigeration system can operate.

Science News Letter, October 10, 1931

PSYCHOLOGY

Forgetting Believed Not Primarily Due to Disuse

WHEN THE stenographer blames lack of dictation for her loss of memory of shortland, she is laying the trouble to only a minor factor in her forgetting, is the assumption that can be drawn from a recent psychological study of this failing. Forgetting is not primarily due to disuse, but to the experiences that occur during the period of disuse, Dr. John A. McGeoch, of the University of Missouri, stated.

"Disuse is significant only in that it gives other factors a chance to operate," Dr. McGeoch said. The experiences which follow the learning may have a backward-acting effect in inhibiting memory.

"Other factors, such as the method of learning, the age of the subject, the character of the material, and disuse itself, may set limits to the operation of the primary factors, but are themselves secondary in importance."

Forgetting is not just the opposite of remembering, Dr. McGeoch believes.

Science News Letter, October 10, 1931

ASTRONOMY

Stories in October Skies

How Perseus Rescued Andromeda from the Sea Monster And how Orpheus Charmed Eurydice and Became a Swan

By JAMES STOKLEY

SIX brilliant stars, all of the first magnitude, and the planet Saturn, equally bright, are to be seen in the evening sky in October. Most brilliant of the stars now visible is Vega, in the constellation of Lyra, the lyre with which Orpheus charmed the nymph Eurydice, according to the mythological story. High in the western sky, its bluish-white light leaves no doubt of its identity. Indeed, of all the stars in the sky, that are visible from these latitudes, only two exceed Vega in brightness. One, of course, is our own sun, which is a star just like those that shine in the evening sky, except that it is far closer. The other is Sirius, the dog-star, visible during the winter.

Directly above Vega is the constellation of Cygnus, in which is the star Deneb, white in color, and considerably fainter than its neighbor. Frequently Cygnus is called "the Northern Cross," and this figure is now easily seen, for the cross is upright in the sky, with Deneb at the top. Though not as bright as its counterpart, the Southern Cross, which can only be seen from southern countries, the northern one is a more perfect cross. The Southern Cross consists only of four bright stars, marking the cross' extremities, but the one that we can see this month has an additional star at the intersection.

Legends Vary

The name Cygnus, however, really means "the swan," and the legends about it vary. One story has it that this is Orpheus himself, who was changed to a swan at his death and was appropriately placed in the sky near his beloved harp. But another legend makes it the swan into which Jupiter changed himself when he visited Leda, queen of Sparta. It is more easy to recognize the swan than some of the other constellation figures. Deneb marks the tail, and the arms of the cross the open wings. The foot of the cross is the swan's long neck, outstretched as he flies through the air. The star at the swan's head is called Albireo, but though it is bright, it is not quite of the first magnitude.

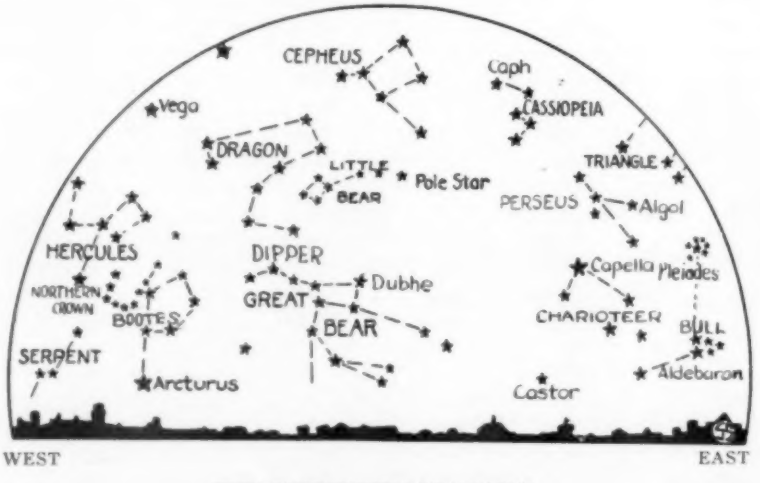
A little to the south of Lyra, and about as high above the horizon, can be seen another brilliant star, Altair, which marks the constellation of Aquila, the eagle. In this case it is rather hard to see any resemblance between the bird and the group of stars. With Vega and Deneb, Altair forms an isosceles triangle, a convenient guide from which to locate other stars. Mythologically, Aquila represents the eagle that bore aloft to the sky Ganymede, the cupbearer of the gods.

Turning to the southern sky, we can see another figure which, while not made of first magnitude stars, is also a useful guide for constellation study. This is the great square in Pegasus, high in the south, the stars marking the corners being of nearly similar brightness. As a matter of fact, only three of the stars are in the constellation of Pegasus, which also includes the stars to the right of the square. These represent, inverted, the head and forefeet of the famous winged horse that sprang from the blood of the Medusa, after she had been decapitated by Perseus. The star in the northeastern corner of the square is called Alpheratz, and is in the constellation of Andromeda, the lady who was chained to the rock to be devoured by a sea monster. This was done as a punishment to her mother, Queen Cassiopeia, who had boasted that she was more beautiful than the sea nypmhs, thus greatly angering Neptune. Her father was Cepheus, king of Ethiopia. Fortunately, she was rescued by Perseus, who arrived in time on the back of Pegasus and bearing the frightful head of the Medusa. He showed this to the monster, the beast was turned to stone, and Andromeda was released. Practically all the characters of this story are represented in the sky. Cassiopeia is just to the north of Andromeda, and is represented by the familiar W-shaped group of stars. To the west of Cassiopeia is her husband, Cepheus, and to the east the hero, Perseus. The sea monster is represented by the constellation Cetus, below Andromeda near the horizon.

The Southern Fish

The other first magnitude stars of the month are also near the horizon. Low in the south can be seen a bright star, Fomalhaut, that marks the southern fish, Piscis Austrinus. A little above the eastern horizon can be seen a star of a distinctly ruddy color. This is Aldebaran, the eye of the bull, Taurus. A little higher, and farther north, just below Perseus, is Auriga, the charioteer, which contains the brilliant Capella, next to Vega in order of brightness among the stars that we can see.

Saturn, the only naked-eye planet to be seen in the evening sky this month, is low in the southwest, in the constellation of Sagittarius, the archer. It is below Altair, and its steady yellowish



THE NORTHERN HEAVENS

This month contain Vega, the brightest star now visible in the evening. Close to the horizon can be seen the Great Dipper, of the constellation Ursa Major, and above it the familiar Little Bear.

light makes it easily located. In brightness it is inferior to Vega and Capella, but brighter than Altair, Aldebaran, Fomalhaut or Deneb. However, it is so low in the sky that it is somewhat dimmed, because its light has to pass through a greater amount of the earth's atmosphere before it reaches our eyes.

If you get where you have a clear view to the north, you will see the Great Dipper in Ursa Major, the great bear, just above the horizon. This constellation is now at its lowest point in the evening, for it is one of the so-called "circumpolar" groups. Most of the constellations, like Aquila or Orion, rise over the eastern horizon, cross the sky, and set behind the western horizon. But the circumpolar constellations never set. They swing around the north pole of the skies, around which all of the stars seem to turn. Actually, this point is simply the part of the sky directly above the north pole of the earth, which itself is turning. At the north pole, all of the constellations that can be seen are circumpolar, and there, during the long six months' night, no star would rise or set, but each would make a complete swing around the observer, every 24 hours, always at the same height above the horizon. As no man has ever been at the north pole during the Arctic night, no one has ever seen this effect in reality, but it can be duplicated with the marvelous Zeiss planetaria, which will soon be in operation in several American cities, the first having opened last year in Chicago.

At the equator of the earth, there are no circumpolar constellations. There, the north pole of the heavens is directly on the northern horizon, and the south pole is similarly on the horizon due south. Consequently, all the constellations set and rise during each 24-hour period.

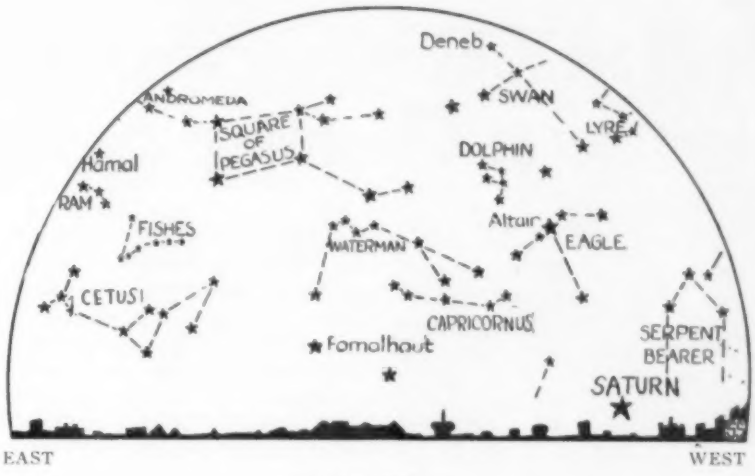
Constellations that Never Set

At a point in middle latitudes, like that of the United States, about 40 degrees north, you can imagine a circle drawn in the sky, with the polar star at the center, and the lower edge just touching the northern horizon. This circle includes all the constellations that never set. For 40 degrees north latitude they are Ursa Minor, the lesser bear, in which is located the pole star, Polaris; Draco, the dragon, which partially encircles the pole; Cepheus; Cassiopeia; most of Ursa Major, the great bear Camelopardalis, the giraffe, and a part of Lyncis, the lynx, two minor constellations containing no bright stars.

Anyone with a camera can make a simple experiment to show how the stars seem to revolve around the north pole. All you have to do is take your camera some dark clear night and set it so that it points to the northern sky. It had better be away from any city lights. Open the shutter, as you would for a time exposure, and leave it, firmly supported, for several hours, or all night if you wish. It should be closed before the break of day, however. When the film is developed, the stars will show as arcs of concentric circles, with the pole at the center. Near the center you will see a very small arc. This is the pole star itself, which is thus shown to be not exactly at the pole. Actually, it is about a degree and a quarter, or two and a half times the width of the full moon, away from that point. Photographs through large telescopes have revealed several hundred stars still closer to the pole, but all very faint.

In addition to the rotating around the pole every day, the stars turn around another point at the same time. This is a point in the constellation of Draco, known as the pole of the ecliptic. But instead of taking 24 hours for one rotation, this takes 25,600 years. As a result, our pole star is only the temporary occupant of that place of honor. About 3000 B. C., the star which we call Thuban, in the constellation of Draco, was the pole star, and it will be again about the year 23,000 A. D. But before that time, in the year 14,000, Vega, which is now so conspicuous in the western evening sky, will mark the pole.

Besides the stars already mentioned, October brings an eclipse of the sun. But though it is the largest of any of the three solar eclipses this year, it is not total, and so is scientifically unimportant. It will be seen only from a remote part of the world, including the south pole and the southern tip of South America, so it will attract little attention. It occurs on October 11.



SATURN

The only naked eye planet to be seen shines low in the southwest and its steady yellow light makes it easily located. Fomalhaut, not far bove the house tops, is one of the six first magnitude stars visible in October evenings.

Slice Bitten Out

At that time the moon will cover about nine-tenths of the sun's diameter, so, where it is visible, a goodly slice will seem to be bitten out of the sun's disc. But the remaining tenth is more than enough to prevent any of the observations for which astronomers frequently travel around the earth to observe a total eclipse of the sun.

An eclipse of the sun, whether total or partial, always occurs at new moon, so this phase is on the eleventh also. Last quarter comes on the fourth, first quarter on the 18th and full moon on the 26th. Thus, from about the 15th to the 28th, moonlight evenings will be available for any use to which they may be put.

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Fish have been added to the livestock which farmers may raise for profit; at least, 15 Nebraska land owners have taken to raising game fish to be sold for restocking of ponds.

According to health officials, drinking fountains should have the water flowing out at an angle rather than vertically, because the vertical bubble allows water to flow back into the fountain, thus introducing germs.

CHEMISTRY

Harmless Chemical Proving Effective as Cleansing Agent

A NEW and powerful chemical for cleansing purposes is described by Chester L. Baker, industrial chemist of Berkeley, Calif., in a report to the American Chemical Society. The preparation is known to chemists as sodium metasilicate. It is proving especially effective in commercial milk-bottle washing and other operations where a very thorough riddance of grease from glass is necessary.

Unlike soap, the new cleanser calls for no vegetable or animal matter in its manufacture. It is very closely related to water-glass, the sirupy product employed commonly in egg preservation. Like water-glass, it requires only soda and sand as its essential chemical sources.

For many years chemists were unable to crystallize the silicate so as to get a standardized white powder which could be readily dissolved as needed. The new washing agent is the outcome of industrial success in crystallizing metasilicate with five parts of chemically combined water. The result is a granulated solid, handy to use, and with peculiarly effective habits.

Holds Strength in Reserve

It is claimed that sodium metasilicate has the highest alkalinity of any washing compound save only common lye. Within limits, cleansing ability is measured by intensity of alkaline chemical activity. Unfortunately lye is not only too active for use in washing cloth of any kind, but is so powerful that it will attack even hard glass as well as such metals as aluminum, tin and zinc. The metasilicate, while containing a large percentage of available alkali, holds its main strength in reserve, and releases it in just sufficient intensity to attack the most refractory greases without damage to the article washed. In this performance it seems to excel even the very popular and highly approved trisodium phosphate of commerce.

Sodium metasilicate, according to Mr. Baker, has the power of making common soap yield more abundant suds than soap and water alone would produce. Quantity of suds is regarded as a critical index of efficiency. Furthermore, metasilicate solution has an unusually high power of wetting glass. This ability permits the pushing aside and elimination of grease. At the same time no poisonous material is involved. A considerable use of the preparation in laundries is anticipated.

Although possessing these valuable qualities in solution, sodium metasilicate must be handled with care in the granular form in which it might be retailed. The sprinkling of the solid granules upon the wet surface of a painted board would cause serious damage to the finish on account of the formation of highly concentrated alkali solution around the granules. A careful user will see that the material is thoroughly dissolved before use.

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BOTANY

Colored Flower Juices Used for Acidity Tests

COLORED flower-saps, extracted from the petals of a number of species, are being used to test the degree of acidity or alkalinity of chemical solutions, by Dr. E. P. Smith, a British botanist. Dr. Smith has determined the color-values of a number of saps in the presence of a wide range of acidities and alkalinities. Among the flowers he has used are species of anemone, cineraria, hibiscus, primrose and tulip.

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INVENTION

One-Eyed Robot Sorts Cards And Solves Business Problem

A ONE-EYED robot that sorts and classifies printed cards may solve a problem that vexes many a big business office. This new electrical and mechanical device is science's latest answer to demands for assistance in classifying bills, checks and other records dealt with in usual office routine.

The robot not only reads cards, but automatically places them in any of the 100 compartments in the machine where they belong. An "electric eye" or photo-electric tube is the operating agency, and it is through this eye that the robot determines the destination of each particular card. But one person is required to attend the robot, which does the work formerly done by scores, and without the errors too often introduced by the "human equation."

Operation of the robot is quite simple. Instead of numbers on the stubs returned from bills sent out by the business concern, a code is used. The attendant feeds into the machine a supply of these stubs or cards, all coded differently. Each card passes under a beam of light, and the reflection from the card, broken by lines of code, reaches the electric eye. The eye, in turn, transmits the signals to the relays and switches which cause a mechanical hand to route the card properly. Reading of the card takes place in a fraction of a second and the robot operates at a high rate of speed.

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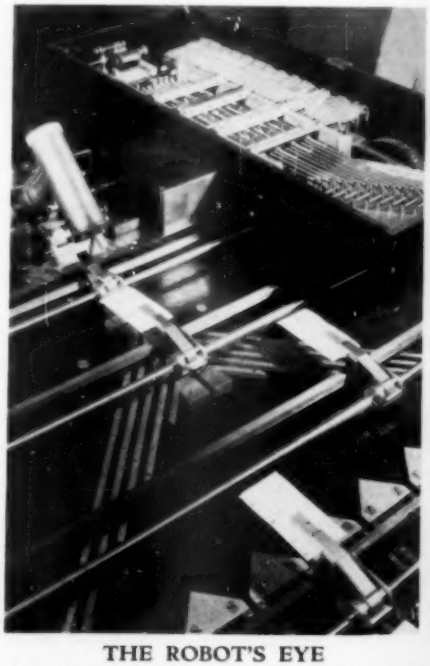

THE ROBOT'S EYE

Or photo-electric tube, reads the code number on the card and routes it to any one of the hundred compartments of the classifying machine.

ENTOMOLOGY

Man Pictured as Aggressor in World-Wide War On Insects

WAR between mankind and the insects, incessant on a thousand fronts, is shown in a new light by Dr. L. O. Howard, recently retired chief of the U. S. Bureau of Entomology. In a new book, "The Insect Menace," he calls attention to the somewhat neglected scientific fact that it is man who has invaded the insect world, rather than that the insects are aggressors against man.

Insects were on earth long before man, or any of the mammals, or even the great lumbering dinosaurs, Dr. Howard points out. Insects flitted and scrambled through the weird forests of the Coal Age, many millions of years ago, when the highest forms of vertebrate life were relatives of the frogs and salamanders. There were giants among them, too: dragonflies with a twelve-inch wing span, and cockroaches as big as mice.

Small Size Advantageous

Evolutionary progress among insects has constantly tended toward producing smaller sizes; in this the insects have differed from the backboned animals, which have always tended to produce bigger and bigger individuals in any given developmental line, ending with unadaptable giants that have been snuffed out by relatively sudden environmental changes. Having small bodies, insects can hide from their enemies more easily. Moreover, they do not need so long a time to grow to maturity: a fly, for example, is ready to produce a family in 21 days, instead of the 21 years or so required by a human being. This makes for easier adaptation to changing conditions, especially when one takes into account the enormous number of offspring produced by insects, out of which only a few especially favored individuals survive.

The real warfare between insects and man began when man became a farmer. Being a farmer means playing favorites with certain plants and animals, increasing their numbers many thousandfold over their former abundance in the wild state. Wild plants and animals have their insect enemies, but it is only when they are massed on farms and ranches that these insects breed to the proportions of crop and herd pests.

Some figures quoted by Dr. Howard give vividness and point to his picture of the field of war. His former colleague in the Bureau of Entomology, Dr. C. L. Marlatt, who succeeded him as its chief, has estimated the total yearly money losses due to insects in this country alone at over $1,500,000,000. This was based on a crop census some years ago. On the basis of a later census, Dr. Howard raises the estimate to more than $2,200,000,000.

Insecticides used in the chemical warfare division of the insect-fighting army cost annually over $23,000,000, of which about $13,000,000 goes for fighting household insects alone. Another item in the household defense budget is screening, for which Americans paid out in a single season $30,000,000, based on the price in the roll. The United States government keeps 500 entomologists at work, at an annual expense of $10,000,000; and various state governments spend a great deal more, bringing the total for this highly-trained professional service close to $200,000,000 a year.

Dr. Howard regards the present situation as serious, but by no means hopeless. The insects will not wipe us out, as many alarmists claim, he says. But unless the attack on them is pushed home hard, the war may well drag itself out inconclusively for many generations. The time for decisive action is now, says Dr. Howard.

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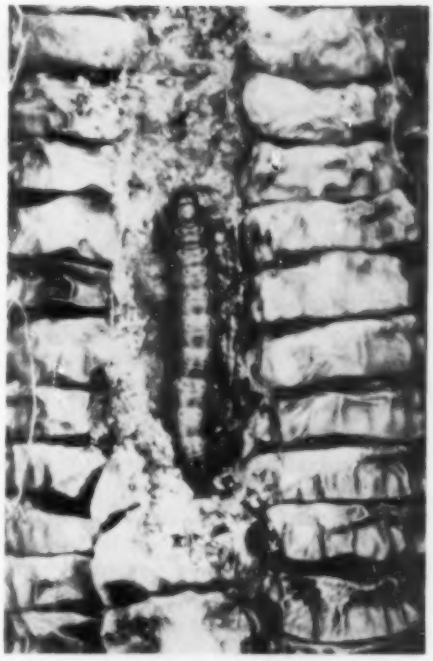

EUROPEAN CORN BORER

This insect has slipped through the lines and is now attacking the eastern part of the corn belt.

NATIONAL PARKS

Protection is Urged For African Animals

AFRICAN WILD LIFE is succumbing to civilization, and in fifty years there may be no elephant, hippopotamus, or rhinoceros left, says Major R. W. G. Hingston, Oxford University explorer, who has recommended ten national parks for African animals.

Of all wild life, he considers that of Africa most important, for its abundance, variety, size, unique character, and prehistoric appearance. The elephant, rhinoceros, hippopotamus, giraffe, okapi, and gorilla are the most impressive of earth's creatures, he holds.

Wild life needs a place of its own, for it is agriculture's enemy. Elephants trample banana plantations, and sometimes destroy in a single night the food of a village for a season. The buffalo eats corn, and tramples more than he eats. The hippopotamus ruins rice beds on river banks, and zebras break down fences. The giraffe, thought innocent before, varies his diet of thorns with man's more juicy crops.

Trade the Great Destroyer

Lions destroy livestock, leopards carry off small animals, hyenas feed not only on carrion, but on small stock and sometimes children, and buffaloes charge human beings.

Trade is the greatest wild life destroyer. The blaubok, quagga and other animals have been extinct for years. The white rhinoceros is practically gone, and other species will soon not be seen again. The world wants the elephant's tusks, rhinoceros' horns are an aphrodisiac in China, buffalo and zebras have valuable skins, monkeys make coats and rugs, and the giraffe gives meat, leather, bowstrings, and bracelets from its tail-hair to the native. The sportsman is the least serious of animal destroyers, Major Hingston said.

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AGRICULTURE

Science Hailed as Saving World From Starvation

SCIENCE has saved the world from starvation. The demand for food supplies since the beginning of the present century has been such that without the aid of the engineer, the chemist, the geneticist and other trained workers, international want would be faced today.

In an address before the hundredth anniversary meeting of the British Association for the Advancement of Science this week, Sir E. John Russell, internationally known agricultural scientist, reviewed the salient events in England's agricultural history and pointed to the contributions of science to world agriculture. Specially-bred varieties of wheat, he stated, had made possible the profitable cultivation in Canada of countless idle acres. The development of the reaper binder and internal combustion engine were named as engineering achievements that had resulted in greater output and increased wealth.

Study of plant and animal diseases in South Africa has rendered a vast area safe and productive, Sir John continued, and the application of soil chemistry has been of universal benefit. Bacteriologists and refrigerating engineers made possible the important dairy and meat products industries of Australia and New Zealand, he said. Irrigation in India was pointed out as a science contribution which was an unmixed blessing.

"Modern science, in short," Sir John said, "has been so successful in increasing man's power over Nature that it has brought us harvests far more bountiful than we know what to do with. Science is still advancing, and no one can tell what it will achieve next."

Further achievement was necessary, he continued, commenting on the destruction of crops and livestock by invisible causal agents, the filterable viruses.

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ARCHAEOLOGY

Downtown Mexico City Yields Ancient Relics

AZTEC stone sculptures, pottery vessels, and human skeletons have just been unearthed in a spot in Mexico City comparable to Fifth Avenue and Forty-second Street in New York. The remains were found by workmen excavating for the foundations of a new business building at San Juan de Letran Street and Juarez Avenue.

Practically across the street in other times were found ornaments of gold and a variety of objects. It is the spot, where on the "Sad Night" of July 1, 1520, the fleeing Spaniards, burdened with Indian treasure, were attacked by the Aztecs, according to historical researches made some years ago by Dr. Manuel Gamio, well-known Mexican anthropologist. This was one of the boundaries of the ancient city in the lake.

Tenochtitlan, as Mexico City then was called, was an American Venice built in a lake, with causeways leading to land, and many canals. When the Spaniards fled, each of the soldiers took as much gold as he could, but many of them fell into the lake with their booty and never came out.

Measurements of the skeletons just found may reveal whether they were Spanish or Aztec soldiers. Mexican Government archaeologists, under the direction of José Reygadas Vértiz, take charge of such excavations where remains are found by accident.

The whereabouts of the "treasure of Montezuma" has never failed to intrigue the curious and romantic. Some guessed the Aztecs had recovered it and carried it away, forgetting at last the hiding place. Many searches have been organized, and even American stock companies have been formed in the past to find the treasure. In fact, Mexican treasure of various origins has been the motive of numerous searches.

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MEDICINE

Find Skin Has no Disinfecting Power

THE SKIN does not have the power of disinfecting itself or of killing microbes that get on it, John F. Norton and Marguerite F. Novy of the Detroit Department of Health have reported to the American Public Health Association.

One group of scientists, Dr. Lloyd L. Arnold and associates of the Illinois State Department of Health, have reported experiments showing that the skin did have this disinfecting power. The Detroit investigators were unable to find any evidence of inherent germ-killing properties of the skin. Microbes that had been left on the skin for about ten minutes did lose their ability to live, but if the skin was kept moist, only a few of them died. Apparently it was the drying effect of being left on the skin that killed the germs, and not the skin itself. Filter paper, glass slides, tanned hides and other materials produced the same effect as the dry skin.

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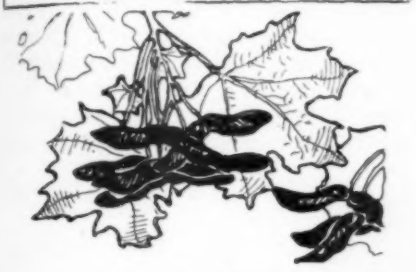
BOTANY

Nature Ramblings

By FRANK THONE



Norway Maple

IN GENERAL, the lover of our North American trees is always a bit inclined to look askance on the planting of foreign species. But even the most hundred per cent. of us is willing to make some exceptions, even as the most ardent advocate of the restriction of human immigration will admit and even welcome some nationalities.

And as the immigration restrictionist is usually willing to see the bars lowered for the tall, hardy sons of the North, the tree lover also is willing to make place for the trees that look down upon the fjords. Norway spruce and Norway maple are desirable immigrants.

The Norway maple is a close cousin to our hard or sugar maples. It looks so much like them, indeed, that a second glance is usually needed to detect differences. The differences are there, nevertheless, and in some of them reside the precise point of the Norway maple's high quality as an ornamental or street tree.

In the first place, the Northern tree has a very neat, compact, close-shaven appearance, forming a fine round ball of a head, as though someone had gone over it with hedge shears. It is even more compact and densely-leaved than the top of our hard maple. The leaves average rather smaller than those of the American hard maple.

The seeds, too, mark it off from the native species. In the sugar maple the two seeds are set nose to nose at a blunt angle, but in the Norway maple the angle is even blunter, amounting frequently practically to a straight line. A pair of these seeds might almost be used as the model for a bizarre little airplane.

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Forest soil, because of its humus and leaf litter, is softer and lighter even than newly plowed loam.

ENGINEERING

Artificial Lagoon Ends Ice Troubles in Water System

ICE TROUBLES threatening the enlargement of the water supply of Detroit might be avoided, it was argued, if only a big lagoon existed in the Detroit River. Engineers got together and removed the "if"; they built a lagoon.

Such a method of insuring an iceless flow of water from the river into the filtration plants of the city, an account in the *Engineering News-Record* explains, is a distinct departure from modern waterworks practice. It required extensive dredging below the river bottom and the building of two rock dikes. Piers of steel and concrete were constructed to define the upstream and downstream sides of the entrance to the lagoon, and provision was made for an outlet to remove refuse.

The effectiveness of the lagoon in eliminating, or greatly reducing, ice troubles lies in the operation of natural phenomena. Needle-like ice, the type which is the chief offender in the Detroit region, will not form under an ice sheet. These ice sheets, in turn, form most quickly over a quiet body of water, such as is provided in a lagoon. Furthermore, given slow enough stream velocities and sufficient time, the needle ice carried in from the river will rise to the surface and stick to the ice sheet before reaching the intake tunnel of the water system.

As adequate data was lacking on the matter of "ice" lagoons, dimensions of the one in the Detroit River, situated at the head of Belle Isle, became a question of judgment. The lagoon now is almost half a mile long, with widths varying from 480 to 280 feet. It has the shape of a long, narrow oval open at one end, and comprises a water area of 20.7 acres. The lagoon feeds the new intake of the Detroit waterworks which is estimated to have sufficient capacity to meet demands of the water system thirty or forty years hence.

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PHYSIOLOGY

Climbing Mount Everest Possible With Oxygen

MEN can climb to the highest earthly mountain altitudes by simply carrying thirty cubic feet of oxygen, breathing it instead of air, Prof. J. Barcroft of Cambridge University contends. Climbing Mt. Everest is an engineering problem, not mountaineering, since the Barcroft experiments show that a man breathing oxygen at 170 millimeters pressure, far less than that at the top of Mt. Everest, can climb a thousand feet hourly. Prof. Barcroft urged experimentation before further expeditions to the Himalayas.

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• First Glances at New Books

Psychology

THE JUNGLE OF THE MIND—Edgar James Swift—*Scribner's,* 340 p., $2.50. The thick growth of superstition and self-deception is all about us. It has even been increased, the author tells us, by recent rapid strides in scientific knowledge. "We can do all sorts of things with all sorts of rays which we can neither see nor feel. Why then may we not, as some maintain, learn the thoughts of others from brain vibrations? . . . For those who enjoy wandering through a trackless jungle of obscurity it is only a step from electrons and protons to the belief that the table on which I am writing, disease-producing germs, and even disease itself are non-existent hallucinations." This interesting volume will do much to guide those who wish escape from the jungle.

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Zoology

BIOLOGY OF THE AMPHIBIA—G. Kingsley Noble—*McGraw-Hill,* 577 p., $5. There have been several acceptable works on the taxonomy of the amphibia, but a modern book on their physiology, habits and adaptations will fill a long-felt want. Dr. Noble's treatise will be welcomed not merely by specialists in this particular field but by zoologists generally and by students of evolution who appreciate the unique importance of this great group of cold-blooded vertebrates.

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Plant Physiology

PLANT BIOCHEMISTRY—Muriel Wheldale Onslow—*Cambridge University Press,* 204 p., $4.75. The success of this thoroughly scientific treatise is well attested by the fact that in spite of its limited field and technical nature it is now in its third edition.

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Metallurgy

RARE METALS—*Fansteel Products Co.,* 70 p., free. A brief popular account of the history, properties and uses of tantalum, tungsten, molybdenum, caesium, rubidium and columbium.

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Medicine

THE DOCTOR EXPLAINS—Ralph H. Major—*Knopf,* 277 p., $3.50. A remarkably interesting book in which a physician explains, in simple terms, many of the things which the layman wants to know about health and disease. Some of the subjects are heart disturbances, blood pressure, what the doctor finds in a physical examination, hypersensitiveness, diabetes, X-rays, and "the malady of Venus." As Dr. Major himself says, "Many other striking medical discoveries could of course be added. But a wise physician does not overdose his patients, even with facts."

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Aviation

THE MODEL AIRCRAFT BUILDER—Chelsea Fraser—*Crowell,* 384 p., $2.50. The country is full of boys in their middle 'teens who aspire to be fliers. How many there are, and how intensely they are interested in their calling, is well testified by the success of model-building and model-flying contests. This book is sure to become the Bible of this numerous tribe. It not only tells how to build and fly models, but gives detailed directions for the building of ground trainers, in which you sit and manipulate the controls. It also tells how to make model airships and mooring masts, and for the really scientifically-minded youth offers designs for a home-built wind tunnel. Most modern touch of all, it shows how to build a model autogiro that will really fly.

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Chemistry

DIELECTRIC CONSTANT AND MOLECULAR STRUCTURE—Charles Phelps Smyth—*Chemical Catalog Company,* 214 p., $4. This most recent addition to the notable Monograph Series of the American Chemical Society will be welcomed by its special audience in the field of physical chemistry.

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Biology

BIOLOGY NOTEBOOK — W. H. D. Meier and Dorothy Meier—*Ginn,* 160 p., 72c. A loose-leaf laboratory notebook, with spaces for sketches and questions to be answered.

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Entomology

BUTTERFLY AND MOTH BOOK — Ellen Robertson-Miller—*Scribners,* 285 p., $2.50. A revised and enlarged edition of a successful popular book on the insect order that probably has the greatest fascination for the amateur and the casual observer. There are many good photographic and line illustrations.

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General Science

JOURNAL OF URUSVATI, Vol. 1, No. 1—*Himalayan Research Institute of Roerich Museum, New York,* 101 p., 75c, annual subscription, $1.35. The activities in Middle Eastern exploration of Prof. Roerich and the Himalayan Research Institute are well known. Now, the Institute has undertaken a new project, in publishing a journal on Asiatic research and allied subjects. The first, very interesting, issue includes articles on archaeological methods by R. V. D. Magoffin and Count du Mesnil du Buisson; a survey of problems of Tibetan archaeology by Georges de Roerich; an article on Lomonosov, the first Russian chemist, and an article on physical and psychic self-development by C. C. Lozina.

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Physics

A SHORT HISTORY OF ATOMISM—J. C. Gregory—*Macmillan,* 258 p, 10 s 6d. Traces the atom from the Phenician Mochus, who was before Lucretius, down to Dalton, and thence through the modern maze where the atom is no long atomic, and perhaps no longer even made of indivisible ultimate particles, but somehow is an atom still. Students of physics, philosophers and educated readers generally will want this summary.

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Natural History

WILD LIFE IN THE BLUE MOUNTAIN FOREST—Ernest Harold Baynes—*Macmillan,* 140 p., $2. A cheerful, discursive account of the animals of a typical New England mountain region and of the people who live with them, written by an experienced outdoors man.

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Obstetrics

WHAT THE PUBLIC SHOULD KNOW ABOUT CHILDBIRTH—Walker B. Gossett—*Midwest,* 290 p., $2. A physician with many years of obstetrical practice discusses various phases of the subject, such as primitive obstetrical methods, modern hospital methods, twilight sleep, superstitions and maternal impressions, etc. One of the most interesting chapters is the description of the Frontier Nursing Service in Kentucky, written by its director, Mary Breckenridge, and reprinted from the *American Journal of Obstetrics and Gynecology.*

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